

MOLECL

Single-molecule nanofluidics - the future of diagnostics

In a nutshell

Protein modifications such as glycosylation play a critical role in many diseases and in the performance of biopharmaceuticals. However, current analytical methods are slow, expensive, and often fail to provide site specific information about these modifications. As a result, important molecular signals remain hidden, contributing to late diagnostics in diseases such as cancer, neurodegenerative disorders, and autoimmune conditions, as well as batch variability in biologics manufacturing.

Our solution is a nanopore based platform for detecting protein modifications at the single molecule level. By combining solid state nanopores with affinity assays, we enable rapid and site-specific analysis of post translational modifications (PTMs).

Why is our technology important?

Today's analytical technologies for protein modification analysis rely on complex workflows, large instruments, and costly reagents. These limitations slow down research, delay diagnostics, and reduce quality control efficiency in the biopharmaceutical industry. As a consequence, diseases are often detected too late and manufacturing inconsistencies can lead to major financial losses, estimated at around 50 billion CHF per year globally.

Our technology addresses this challenge by enabling direct detection of protein modifications at the single molecule level. The nanopore based approach simplifies workflows, reduces analysis time, and provides site specific information that is difficult to obtain with conventional techniques. This opens the door to faster diagnostics, improved biomarker discovery, and better quality control of therapeutic proteins.

The benefits of our solution

- Single molecule detection of protein modifications
- Site specific PTM analysis that is difficult to achieve with current methods
- Faster and simpler workflows compared to conventional analytical techniques
- Potential to significantly reduce costs associated with diagnostics and biopharmaceutical quality control
- Scalable platform that can support both clinical diagnostics and industrial applications]

Keywords

Nanopore sensing, proteomics, post translational modifications, glycosylation, single molecule detection, biomarker discovery, biopharmaceutical quality control

Founding Team

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